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In Re Application Of:

Ian Llewellyn

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Examiner
David Q. Nguyen

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2681

Invention:

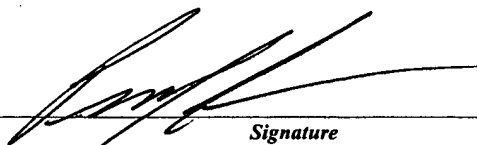
BROADBAND WIRELESS ACCESS SYSTEM

TO THE COMMISSIONER FOR PATENTS:

Transmitted herewith in triplicate is the Appeal Brief in this application, with respect to the Notice of Appeal filed on July 6, 2004

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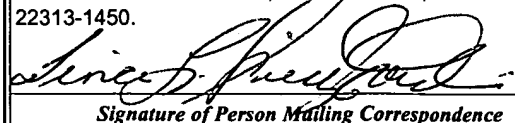
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Signature

Dated: September 28, 2004

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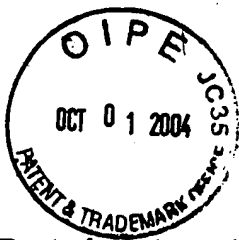
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BRIEF ON APPEAL

(1) Real Party in Interest

This application is assigned to Nortel Networks Limited. The assignment is recorded at Reel 011251, frame 0490.

(2) Related Appeals and Interferences

There are no related appeals or interferences.

(3) Status of Claims

This application was filed with claims 1 through 23. Claims 14-23 have been withdrawn and claim 4 has been cancelled. Claim 1 has been amended twice, claims 3, 6, 10 and 12 amended once and claims 2, 5, 7-9, 11 and 13 retained as originally filed. Consequently, it is the rejection of claims 1-3 and 5-13 that is being appealed. The claims as currently pending are set forth in Appendix A.

(4) Status of Amendments

No amendments were filed after the Final Office Action of April 28, 2004.

(5) Summary of the Invention

The present invention relates to a wireless communication system for communicating data between high density subscriber equipment and an external

network and a method of operating such a wireless communication system. Figure 1 shows a schematic diagram of such a wireless access communication system comprising a base station 3 connected by a distribution network 14 to a plurality of antennas 5 each providing wireless connections to users (for example, WLANs 6) as described in the description on page 6, lines 9-13.

As described in the specification, prior art broadband access systems require extensive cabling within the building in order to reach the subscriber equipment. WLANs provide a known method of broadband wireless access, however typically each WLAN requires separate cabling and interference difficulties arise between adjacent WLANs. It is an object of the present invention to provide an improved broadband wireless access communication system for situations of high density subscriber equipment.

This object is achieved by use of a common modulated radio frequency carrier signal in both the distribution network and over the wireless connection to the subscriber equipment. This is described in the specification on page 8 line 31 to page 9 line 1 with reference to figure 1. The distribution network 14 in figure 1 is shown carrying three carrier frequencies A, B and C. Taking as an example antenna 5W, the antenna receives data on carrier frequency A from the distribution network 14 and interfaces with the subscriber equipment 8W using notional wireless links 9 on the same carrier frequency (A) to form a WLAN 6W. The same carrier frequency A is used by the subscriber to communicate with antenna 5W which then again uses the same carrier frequency A to transmit the data back to the base station 3 via the distribution network 14. In an embodiment the antennas are shown using a frequency selective tap to tap their selected carrier frequency (e.g. frequency A for antenna 5W) from the distribution system.

The system of the invention therefore provides a simple method of communicating to densely populated subscriber equipment with reduced cabling

and additionally enables interference mitigation by separating antennas operating on the same carrier frequency in space.

(6) **Issues**

The following issues are presented:

1. The rejection of claims 1-3, 5, 8, 10-13 under 35U.S.C. 102(b) as being anticipated by Chu et al (US 5,890,055);
2. The rejection of claims 6 and 7 under 35U.S.C. 103(a) as being unpatentable over Chu et al (US 5,890,055) in view of Rypinski et al (US 5,461,627); and
3. The rejection of claim 9 under 35U.S.C. 103(a) as being unpatentable over Chu et al (US 5,890,055) in view of Knop et al (US 6,480,163).

(7) **Grouping of Claims**

Claims 1-3 and 5-13 can be considered as a group.

(8) **Argument**

The rejection of claims 1-3, 5, 8, 10-13 under 35 USC 102(b) as being anticipated by Chu et al (US 5,890,055).

Chu does not disclose a system in which “a common modulated radio frequency carrier signal is used in both the distribution network and over a said wireless connection to communicate said data between a said subscriber equipment and the base station” where “said wireless connection” connects “one or more proximate subscriber equipment to the distribution network” (this

application, claim 1). Instead the system of Chu comprises a base station connected to a hub by a high speed transmission link, the hub is in turn connected to one or more repeaters via a millimetre wave link and the final link from the repeater to the subscriber in the system of Chu operates within the PCS band. Chu teaches that the high speed transmission link between the base station and the hub operates with a carrier frequency of between 1 and 6MHz (Chu, column 6 lines 51-62). Chu further teaches that the link between the hub and the repeaters operates at a carrier frequency of 38GHz or more (Chu, column 5 line 9). Furthermore, Chu teaches that the final link from the repeater to the subscriber operates at one of three possible carrier frequencies, 900MHz, 2.45GHz and 18GHz (Chu, column 4 lines 59-63).

As described above, each link in the system of Chu operates at a totally different carrier frequency. Therefore, the teaching of Chu is incompatible with that of claim 1 of this application wherein "a common modulated radio frequency carrier signal is used in both the distribution network and over a said wireless connection to communicate said data between a said subscriber and the base station" (this application, claim 1).

This fact that each link in the system of Chu operates at a different carrier frequency is further reinforced by the teaching which describes and shows clearly in Chu, Figure 3, that the repeater includes a frequency converter. Such a frequency converter is not required in the system described in the present application because the same frequency is used on both the distribution network and the wireless link to the subscriber.

Consequently the present invention as defined by claim 1 is clearly not anticipated by Chu, since Chu does not disclose use of "a common modulated radio frequency carrier signal" in both the distribution network and over the wireless connection between the distribution network and the subscriber

equipment. The Applicants therefore respectfully submit that the rejection of claim 1 cannot be justified.

The Applicants would however, be prepared to amend the term "a common modulated radio frequency carrier signal" to "a same modulated radio frequency carrier signal" if the Examiner will accept that this more clearly distinguishes the present invention over the disclosure of Chu.

The above arguments in relation to claim 1 are also applicable to independent claims 10 and 12. The Applicants respectfully submit the rejection of these claims cannot also be justified.

Claims 2, 3, 5, 8, 11 and 13 are dependent on claims which are now deemed allowable and it is respectfully submitted that these rejections are moot in light of the foregoing.

In order to more clearly demonstrate the fundamental differences between the system of claim 1 and that of Chu, the Applicants attach a diagram as Appendix B showing two pictorial representations. Basis for the representation of claim 1 can be found in claim 1 of this application and basis for the representation of Chu is detailed in the diagram.

The Examiner also cited Rypinski (US 5,461,627). Rypinski does not disclose use of "a common modulated frequency carrier signal" "in both the distribution network and over a said wireless connection to communicate said data between a said subscriber equipment and the base station" (this application, claim 1), instead Rypinski teaches use of a frequency of 2.5GHz for the wireless link (Rypinski, column 7 line 48) and teaches that the access point translates this carrier frequency from RF to base band giving the example base band data rate of 10-20MBit/s (Rypinski, column 7 lines 46-53).

Finally, the Examiner cites Knop (US 6,480,163). Knop does not describe a wireless communication system and does not teach any of the features of claim 1.

Consequently the present invention goes against the teaching of Chu and is not only novel having regard to this disclosure of Chu, but cannot be said to be obvious having regard to the cited prior art either.

2. The Rejection of Claims 6 and 7 under 35 USC 103(a) as being unpatentable over Chu in view of Rypinski


Claims 6 and 7 are dependent upon claim 1 discussed above and therefore the issue is moot in view of the foregoing.

3. The Rejection of Claim 9 under 35 USC 103(a) as being unpatentable over Chu in view of Knop

Claim 9 is dependent upon claim 1 discussed above and issue 3 is therefore moot in view of the foregoing.

It is respectfully submitted that the continued rejection of claims 1-3 and 5-13 as addressed above cannot be justified and that these claims define a novel and patentable invention having regard to the prior art of record. Therefore, Applicants respectfully request the examiner's rejections be reversed.

Respectfully submitted,


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APPENDIX A

Claims

1. (previously presented) A wireless communications system for communicating data between high density subscriber equipment and an external network, the system comprising:

a base station connectable to said external network;

a distribution network coupled to the base station;

and a plurality of antennas coupled to the distribution network, each antenna providing a wireless connection for one or more proximate subscriber equipment to the distribution network;

wherein said data is communicated between the base station and subscriber equipment by modulating a radio frequency carrier signal, and wherein a common modulated radio frequency carrier signal is used in both the distribution network and over a said wireless connection to communicate said data between a said subscriber equipment and the base station.

2. (original) A system as claimed in claim 1 wherein each said wireless connection is a wireless local area network (WLAN).

3. (previously presented) A system as claimed in claim 2 wherein said data is communicated by modulating multiple radio frequency carrier signals, only one of said signals being used in each WLAN.

4. (cancelled)

5. (original) A system as claimed in claim 3 wherein a said radio frequency carrier signal for a said WLAN is frequency multiplexed onto the distribution network.

6. (previously presented) A system as claimed in claim 3, wherein antennas providing WLANs having common carrier frequencies are spaced apart to minimise co-frequency interference.

7. (original) A system as claimed in claim 6 wherein antennas providing WLANs having common carrier frequencies are physically separated by at least one antenna providing a wireless link having a different carrier frequency.

8. (original) A system as claimed in claim 2 wherein the distribution network is a predetermined radio frequency signal pathway between the base station and the antennas for the modulated radio frequency carrier signal.

9. (original) A system as claimed in claim 8 wherein the signal pathway is a coaxial cable.

10. (previously presented) A method of operating a wireless communications system for communicating data between high density subscriber equipment and an external network, the system comprising a distribution network coupled to a plurality of antennas; the method comprising:

communicating data between the subscriber equipment and the external network by modulating a radio frequency carrier signal to provide a wireless connection between a said antenna and one or more proximate subscriber equipment, wherein a common modulated radio frequency carrier signal is used in the distribution network and a said wireless connection.

11. (original) A method as claimed in claim 10 wherein the distribution network provides a radio frequency signal pathway for the modulated radio frequency carrier signal.

12. (previously presented) A wireless communications system for connecting high density subscriber equipment to an external network, the system comprising:

a base station coupled to a plurality of wireless networks by a distribution network, each wireless network connectable to a number of said subscriber equipment;

wherein the base station communicates with the wireless networks using modulated radio frequency carrier signals, and wherein a common modulated radio frequency carrier signal is used in the distribution network and a said wireless network.

13. (original) A system as claimed in claim 12 wherein the same modulated radio frequency signal is used in the distribution network and within a said wireless network to couple a said subscriber equipment to the base station.

14. (withdrawn) A coaxial cable distribution system for connecting to a plurality of antennas, the system comprising a coaxial cable having a number of coaxial stubs tapped-off therefrom, each tapped-off coaxial stub having means for frequency selectively connecting a said antenna to said system.

15. (withdrawn) A system as claimed in claim 14, wherein said frequency selective means comprises a band pass filter.

16. (withdrawn) A system as claimed in claim 15, further comprising a number of impedance matching transformers incorporated adjacent said tap-offs and arranged to change the impedance of the coaxial cable in order to optimise power transfer between the coaxial cable and each coaxial stub.

17. (withdrawn) A method for connecting to a plurality of antennas comprising:

providing a coaxial cable distribution system having a coaxial cable with a number of coaxial stubs tapped-off therefrom, wherein each tapped-off coaxial stub has means for frequency selectively connecting to one of the antennas.

18. (withdrawn) An impedance matching transformer for a coaxial cable comprising means for changing the diameter of the outer conductor on said cable in order to change the impedance of said cable.

19. (withdrawn) A transformer as claimed in claim 19 wherein said means comprises a clamp arranged about said cable and operated to reduce the diameter of said outer conductor.

20. (withdrawn) A transformer as claimed in claim 18 wherein said means comprises two clamps arranged about said cable and operated to stretch a section of cable between said clamps.

21. (withdrawn) A method of implementing an impedance matching transformer in a coaxial cable, the method comprising changing the diameter of the outer conductor of said cable in order to change the impedance of said cable.

22. (withdrawn) A coaxial cable tap-off point for connecting a first coaxial cable to an end of a second coaxial cable, the arrangement comprising:

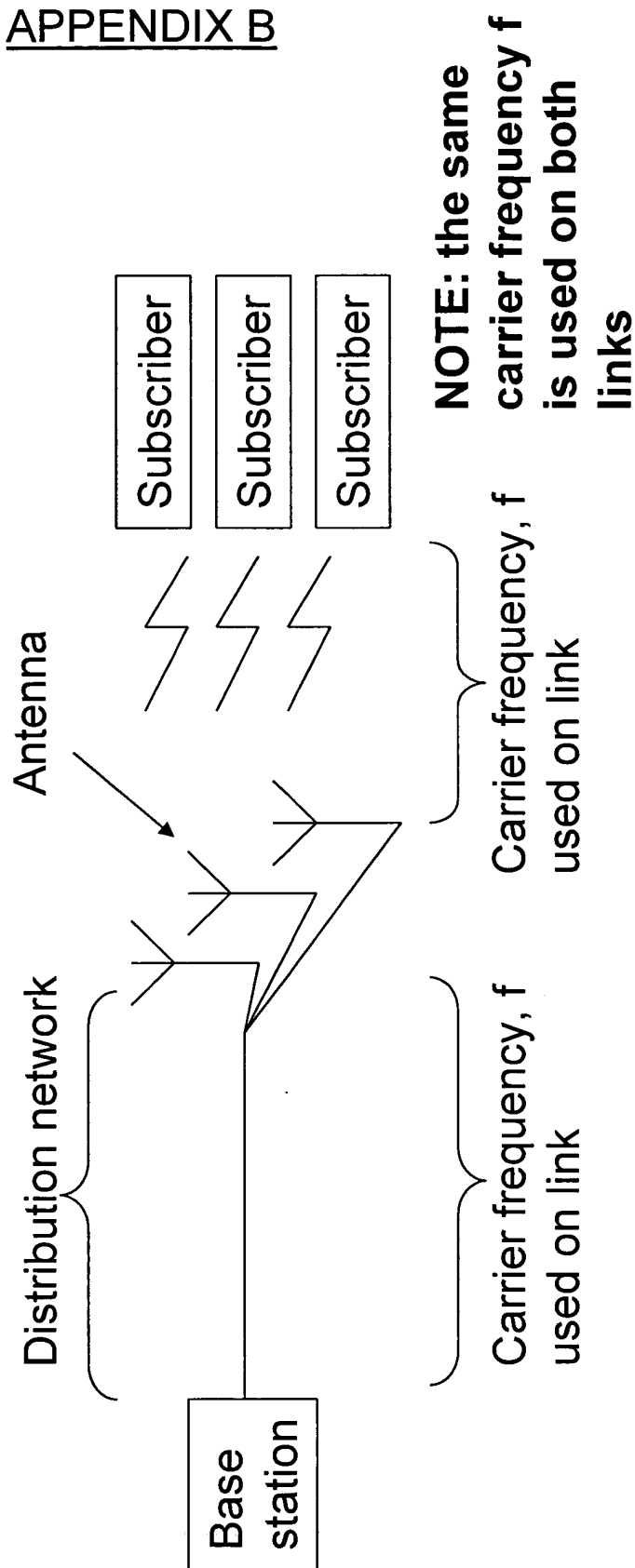
a groundplane extending longitudinally about the outer conductor of said first cable and electrically connected at its distal ends to said outer conductor, said outer conductor having two longitudinally spaced apart circumferential discontinuities located between said connections which expose the inner conductor of said cable;

an antenna element extending longitudinally about said discontinuities, said inner conductor being located between the antenna element and the groundplane;

wherein said groundplane is connectable to the outer conductor of said second coaxial cable, and the antenna element is connectable the inner conductor of said second cable.

23. (withdrawn) An arrangement as claimed in claim 22 wherein said groundplane is a cylindrical collar arranged coaxially about said first cable and wherein said antenna element is located within said collar.

APPENDIX B



Pictorial representation of system of Chu

